

Claims

1. Device for comminuting empty containers, particularly beverage bottles or beverage cans made of plastic, particularly PET bottles or tin plate, comprising

- a housing / frame (1), having a fill-in opening (2), as well as an exit opening (3), and
- a cutting unit (4) disposed in the housing (1), as well as
- means for drive and control of the cutting unit (4),  
whereby
- the cutting unit (4) contains at least cutting rollers (4.1 and 4.2), disposed at a distance from one another with regard to their axes of rotation,

*characterized in that*

the cutting mechanism that contains the cutting rollers (4.1 and 4.2) is a document shredder cutting mechanism.

2. Device according to claim 1,

*characterized in that*

the cutting mechanism is a particle cut cutting mechanism.

3. Device according to claim 1 or 2,

*characterized in that*

- 23 -

a separator / selector (10) is disposed ahead of the cutting mechanism.

4. Device according to claim 3,

***characterized in that***

the separator / selector (10) is a vane shaft that preferably possesses three or four vanes (12), the free vane ends of which trail, seen in the direction of rotation (R').

5. Device according to claim 4,

***characterized in that***

the vanes attached in the center, i.e. on the axle of rotation, are configured in polygon manner (17) or in arc shape (18) towards their free ends.

6. Device according to claim 3,

***characterized in that***

the separator / selector (10) consists of two star-shaped shafts, seen in a side (face) view.

7. Device according to claim 3, 4, 5, or 6,

***characterized in that***

- 24 -

stabbing elements (21) that point in the direction of rotation (R') are disposed on the surface segments of the separator (10) that contact the fed-in containers part of the time.

8. Device according to at least one of the preceding claims,

***characterized in that***

the so-called cutting play (16) between adjacent cutting disks (5) of the cutting mechanism has a value between 0.005 mm and 2 mm.

9. Device according to at least one of the preceding claims,

***characterized in that***

the overlap of adjacent and opposite cutting disks (5) has a value between 0.5 mm and 15 mm.

10. Device according to at least one of the preceding claims,

***characterized in that***

the cutting rollers preferably consist of the material 42CrMoS4.

11. Device according to at least one of the preceding claims,

***characterized in that***

the cutting disks (5) of the cutting rollers (4.1 and 4.2) are hardened.

12. Device according to at least one of the preceding claims,  
**characterized in that**

the bearings of the cutting rollers (4.1 and 4.2) are set into  
their bearing plates (8) from the outside.

13. Device according to at least one of the preceding claims,  
**characterized in that**

the diameter (D) of the cutting disks (5) lies in the range of  
50 to 200 mm, preferably amounts to 80 mm +/- 10%.

14. Device according to at least one of the preceding claims,  
**characterized in that**

the drive (7) of the cutting rollers (4.1 and 4.2) is preferably  
designed for speeds of rotation in the range of 30 to 150 rpm.

15. Device according to at least one of the preceding claims,  
**characterized in that**

strippers (4.6) are disposed between the cutting disks (5),  
whereby standard strippers of document shredders are used.

16. Device according to at least one of the preceding claims,  
**characterized in that**

- 26 -

a photo eye is disposed in the region of the fill-in opening (2), to generate a starting pulse for the cutting rollers (4.1 and 4.2).

17. Device according to at least one of the preceding claims,

***characterized in that***

nozzles are disposed in the housing (1), to apply disinfectant to the cutting rollers (4.1 and 4.2) and/or the fill-in opening (2) and the outlet opening (3).

18. Device according to at least one of the preceding claims,

***characterized in that***

the cutting disks (5) have grooves (6) worked into their circumference surface (5.1), whose trailing flank (6.3), in the direction of rotation (R, R'), forms a cutting tooth (5.3), together with the circumference surface (5.1), which tooth has an acute angle and points in the direction of rotation, whereby the groove flank (6.3), which begins at the tip, has a linear progression as well as a progression directed counter to the direction of rotation (R, R'), and the subsequent transition region (6.4) to the groove base (6.2) and/or the groove flank (6.1) that lies in the direction of rotation is configured in arc shape.

- 27 -

19. Device according to claim 18,

***characterized in that***

the two groove flanks (6.1 and 6.3) run parallel to one another or diverge from one another.

20. Device according to claim 18 or 19,

***characterized in that***

the tip angle (W) of a cutting tooth (5.3) preferably lies between 45° and 80°.

21. Device according to claim 18, 19 or 20,

***characterized in that***

the arc defined by a groove (6) and a segment of the circumference surface (5.1) of a cutting disk (5) that follows same (6) is preferably determined, by 40%, by the groove (6).

22. Device according to at least one of the preceding claims,

***characterized in that***

the device can be coupled to automated bottle and/or can return machines or integrated into same.